



# The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

[www.pretoria-astronomy.co.za](http://www.pretoria-astronomy.co.za)

## NEWSLETTER JULY 2005

The next meeting of the Pretoria Centre will take place at Christian Brothers College, Pretoria Road, Silverton, Pretoria

Date and time	Wednesday 27 July at 19h15
Chairperson	Michael Poll
	Annual General Meeting (to take less than 20 minutes)
What's Up	by Mike Haslam

+++++++ LEG BREAK - Library open ++++++

### MAIN TALK

## The Earth as a Planet By Prof Morris Viljoen

The meeting will be followed by tea/coffee and biscuits as usual.

The next social/practical evening will be held on Friday 22 July at the Pretoria Centre Observatory, which is also situated at CBC. Arrive anytime from 18h30 onwards.

### INSIDE THIS NEWSLETTER

LAST MONTH'S MEETING .....	2
LAST MONTH'S OBSERVING EVENING .....	2
THE MESSAGE ON THE VOYAGER SPACECRAFT.....	3
ASTRONOMICAL WEBSTE ADDRESSES .....	3
GOING WHERE NO ONE HAS GONE BEFORE .....	4
STARS OF THE SOUTHERN SKY 2ND EDITION.....	6
DEEP IMPACT AT TEMPEL 1 .....	6
CCD IMAGES OF TEMPEL 1 .....	7
ASTROPHOTOGRAPHY .....	8
PRETORIA CENTRE COMMITTEE .....	8

## Last month's meeting — by Barbara Cunow

This meeting was attended by about 60 members and visitors. The evening started with Peet van der Walt telling us about the beauty of the Messier objects, and how to find them. Winter time in South Africa is a good time to look for the Messier objects, because Scorpius and Sagittarius which contain a number of Messier objects are now high in the sky.

After that Johan Smit told us all about what is going on in the sky. We learned that Mercury, Venus and Saturn are close to each other low in the Northwest after sunset, so if you have never seen Mercury, now is the time.

After the break, we had the opportunity to listen to Robert Groess, a PhD student of astronomy at Wits University, who traveled all the way from Johannesburg to share with us the latest about SALT, the Southern African Large Telescope at Sutherland. SALT is the largest optical telescope in the Southern hemisphere, and it uses some sophisticated design which keeps the cost down so it becomes affordable, but still allows to do world-class science. Robert gave us an excellent overview on what SALT is and how it works. SALT has now reached the stage of completion and we can expect the first exciting results from SALT in the near future.

## Last month's observing evening — by Michael Poll & Johan Smit

A cloud free evening at last, which led to a premium on parking space at the CBC venue. It was very pleasing to see so many people there, and there were at least five telescopes, and various binoculars, as well as the centre 12 inch scope.

The moon was fairly bright, and although some deep sky objects were not as well seen as they could be, there was still plenty on show. Saturn was seen setting in the north-west. The moon was past first quarter so that Copernicus was well placed. Jupiter and its moons were observed, there were three on one side, two of which were close together but drew apart during the evening, one on the other side. There was also a fainter star amongst them, which was slightly above the plane of the moons.

Attention was mostly in the south. Some of us had a long look at the variable stars S Carinae and R Centauri, the latter is at present the brightest that it has been for some time. We also looked at the open clusters Theta Carinae (IC 2602), NGC 3114 (near S Carinae), and the globular cluster Omega Centauri. Double stars included Alpha Crucis, (a three component multiple) and Gamma Crucis (a line-of-sight double). Gamma Crucis is the only one of the four bright stars of the Southern Cross that has a red hue.

Wayne showed us the "Blue Planetary" nebula (NGC3918), near Delta Crucis, one of the few planetary nebulae that can be seen in binoculars (Ref: Sky Guide 2005, page 97). Scorpius is now well placed, and M7, M6 and the profuse star fields around NGC6231 were revisited.

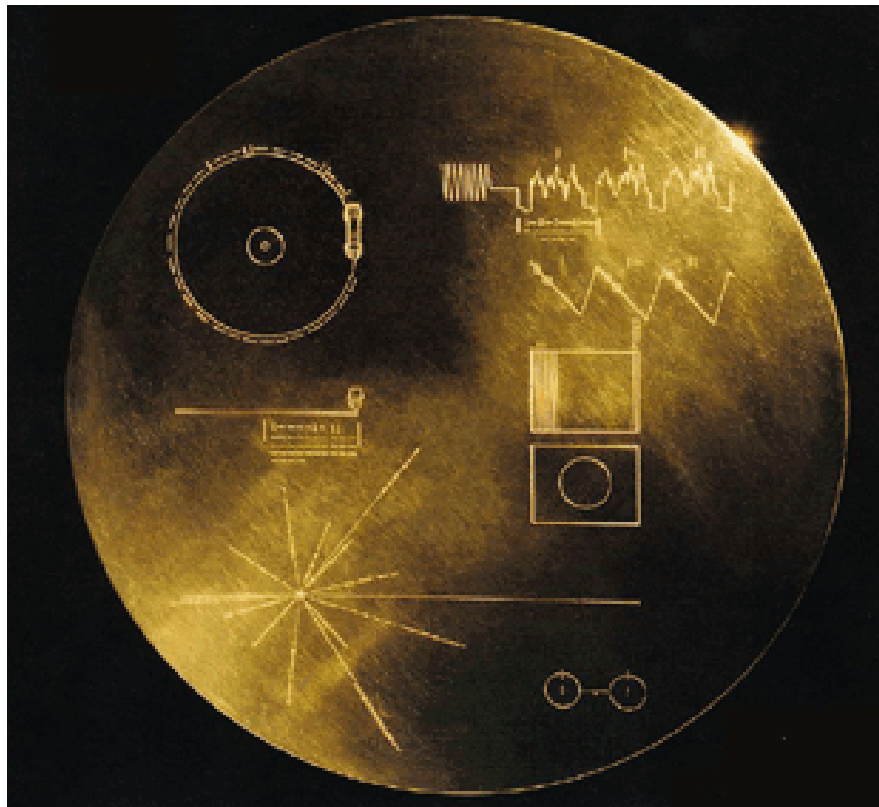
The centre 12" first was aimed at M7. Because of the long focal length of the telescope, even the lowest power eyepiece gives a magnification of nearly 100 times, so the whole cluster does not fit into the field of view. However, although only a small part of it is seen, many more fainter stars than would normally be seen were visible. After M7, we viewed two other showpieces, the Jewel box and Omega Centauri. With the high magnification and narrow field of view these objects fill the whole field. These are truly magnificent sights and were again greeted with many "WOW's" and similar expressions. Just seeing these two objects with the 12" would make a trip out to the viewing evening worth anyone's while.

## The message on the Voyager spacecraft by Pierre Lourens

Remember this picture? It shows a gold-coated phonograph record. Such a record was attached to each of the Voyager 1 and Voyager 2 spacecraft when they were launched in 1977 to explore the outer solar system and then move out of it. Each record contains a message to possible extraterrestrial civilizations. Go to the following website address for more information:

<http://voyager.jpl.nasa.gov/spacecraft/goldenrec1.html>

The definitive work about the Voyager record is the book "Murmurs of Earth" by C. Sagan, F. D. Drake et. al., originally published in 1978. It was reissued in 1992 and that issue includes a CD-ROM that replicates the Voyager record. Unfortunately, the book is now out of print, but it is worth the effort to try and find a used copy or browse through a library copy. Basically, this book is the story behind the creation of the record, and includes a full list of everything on the record.



### Astronomical website addresses

Thousands of astrophotos for your computer screen! [www.finalfrontier.za.net](http://www.finalfrontier.za.net)  
(Sent in by Hetta Pretorius.)

See page 117 of "Sky Guide Africa South" of 2005 for a list of astronomical website addresses.

## Going where No One has Gone Before by Andrie van der Linde

No, this is not about the Starship Enterprise. This is about a 'starship' leaving the mostly uncharted territory it has been exploring for the past 28 years and entering, for all practical purposes, its final frontier.



Oddly enough, Voyager II was launched on August 20, 1977, 16 days ahead of the launch of Voyager I on September 5. Voyager II visited Jupiter (August 7, 1979), Saturn (August 26, 1981), Uranus (January 24, 1986) and Neptune (August 8, 1989). Its navigational error for its encounter with Neptune was a mere 100 km! During the Neptune encounter, Voyager II was swung downward (I guess southward) relative to the planetary orbital plane.

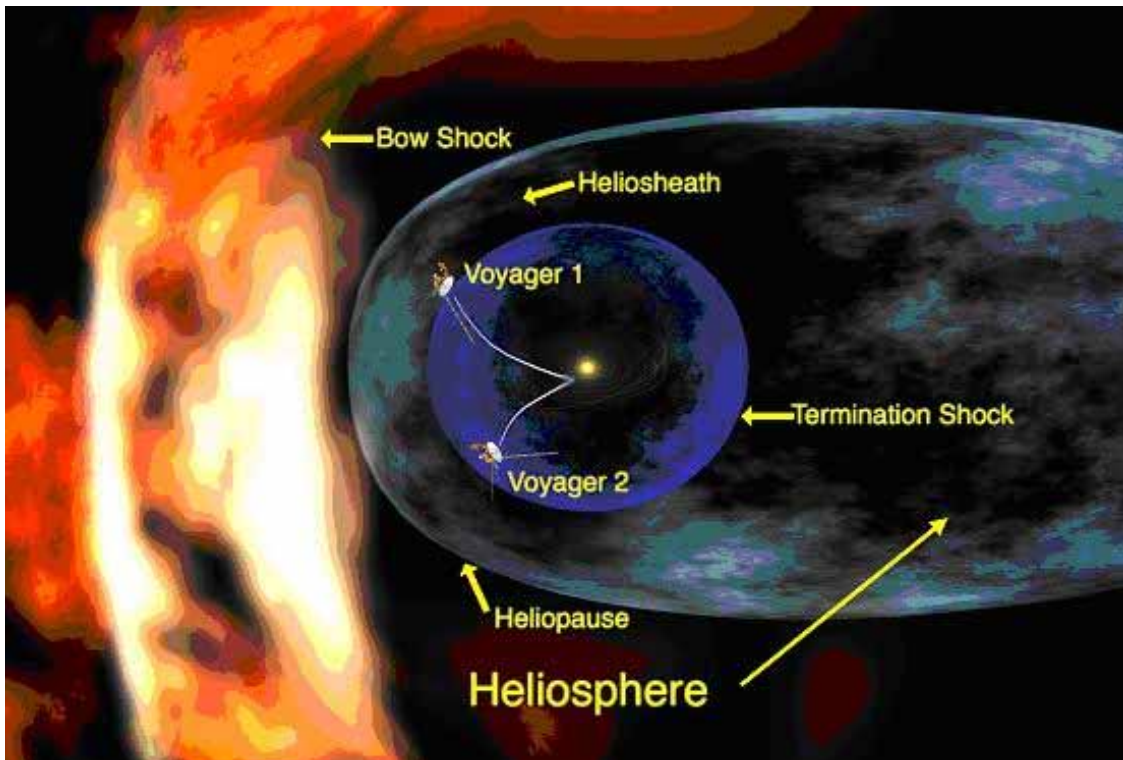
Voyager I overtook Voyager II and reached Jupiter on March 5, 1979. It went on to visit Saturn on November 13, 1980. Voyager I could in principle have headed for Pluto, but the research team opted for a close-up on Titan. Voyager was swung upward (north?) during its Saturnian encounter.

Both probes continued on their respective journeys into space and were used by scientists for various tests, inter alia to track a solar blast (Coronal Mass Ejection) to the edges of the solar system in July 2004. Cassini, Mars Odyssey, Ulysses and various other spacecraft also participated in this test.

Voyager I, travelling at a speed of 3.6 astronomical units (AU) per year and located a staggering 14 x 10<sup>9</sup> km from the Sun, encountered elevated (1.7x) magnetic field

levels in November 2003. This caused some scientists to believe that it had entered the terminal shock area where the solar wind starts to mix with interstellar gas. The charged particles of the solar wind slow down and become denser and hotter. The denser level of the charged particles increases the magnetic field.

In December 2004, measured magnetic field levels increased and maintained a further 2.5x in strength and the Voyager team members now agree that Voyager I has indeed passed through the terminal shock area and has entered the heliosheath.



Voyager II, travelling at 3.3 AU per year and currently located  $10.5 \times 10^9$  km from the Sun still has more than 7 years of travelling to do before it also reaches this milestone. In spite of these incredible distances, both spacecraft are little more than half a light day away.

Originally designed to visit the cold, dark regions of space at Jupiter and Saturn, both Voyagers were fitted with radioisotope thermal generators to produce electric power. These should power all instruments until around 2010. A power savings plan where some instruments are switched off will then go into effect. The spacecraft should last about ten years in this mode where after the power is expected to be too low to operate its instruments. It is expected that communications through their 23-Watt transmitters can be maintained until at least 2030. Both spacecraft have sufficient propellant left to last beyond 2030.

During the 27 years of operation, the Voyagers have visited four planets and studied 48 moons and increased our knowledge and understanding of the solar system tremendously. Who knows what the next step in their uncharted voyage will bring?

## Stars of the Southern Skies (Second Edition) Mary Fitzgerald (Editor)

Many field guides and popular books on amateur astronomy have been written, but few are devoted entirely to the rich skies of the southern hemisphere. Now updated, *Stars of the Southern Skies* draws on the knowledge of South African experts to offer stargazers some unique insights into the night skies in their half of the world.

Superb photographs, star charts, and graphics complement the text. This is a book for anybody who has ever gazed in wonder at the glory of a star-filled sky, a must for all amateur astronomers, and an interesting addition to the shelves of the experts.

**Mary Fitzgerald** is a former Director of the Planetarium, University of the Witwatersrand, Johannesburg.

ISBN: 1 86814 410 0

Size: 240 X 180 mm, 144 pages

Publication: July 2005

Price: R160.00

Please send orders to: Book Promotions, PO Box 5, Plumstead 7800

Tel: 021 706 0949 Fax: 021 706 0941 [orders@bookpro.co.za](mailto:orders@bookpro.co.za)

## Deep Impact

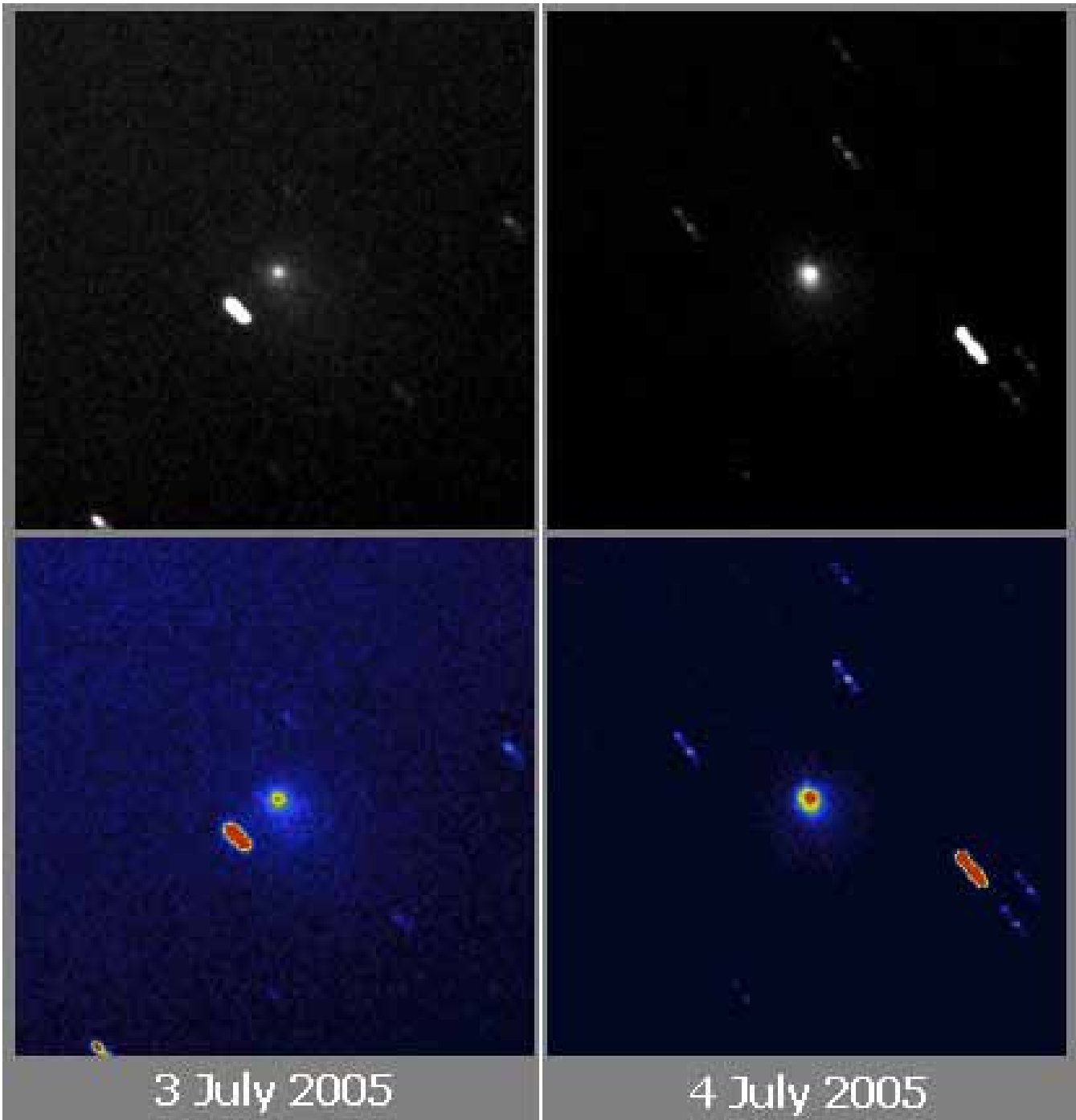
The Deep Impact spacecraft sent an impacting probe to comet Tempel 1 on 4 July. For more information, go to the website with address <http://deepimpact.jpl.nasa.gov>

Below left: This image shows comet Tempel 1 sixty seconds before it ran over NASA's Deep Impact probe at 1:52 a.m. Eastern time (7:52 SAST), July 4. The picture was taken by the probe's impactor targeting sensor.

Below right: This image shows a portion of the surface of Tempel 1 from closer up.



CCD images, made from earth, in black & white and colour of Comet Tempel 1 before (images on left) and after (images on right) the impact of the probe.



### Comet Tempel 1 (9P)

Taken from EtaCarina Observatory, Pretoria, South Africa

Telescope: 8" F/5 SkyWatcher Newtonian

Camera: SBIG ST7 CCD camera

Exposure: 15 x 7 sec on both dates.

Observer: Mauritz Geyser ([mauritzg@iafrica.com](mailto:mauritzg@iafrica.com))

## Astrophotography



Image of Jupiter taken by Mauritz Geyser from his new observatory. Taken with a Quickcam Pro 4000 with a 2x Barlow lens on a f/5 Skywatcher telescope under poor sky conditions. Note the Great Red Spot and the shadow of the moon Europa on the disk of the planet. Date: 2005/02/13 (2005/02/12 UT) Time: 01h44 Local time (23h44 UT) Aligned and stacked 810 frames. (Photo & information from his website.)

### PRETORIA CENTRE COMMITTEE

Chairman	Neville Young	083 303 2840
Vice Chairman	Michael Poll	012 331 1615(h)
Treasurer & Mem Secretary	Rynhardt van Rooyen	011 441 3458(w) 083 654 1862
Secretary	Tony Viljoen	012 654 5783(h) 072 247 6648
Curator of Instruments	Johan Smit	083 306 1199
Librarian	Michael Poll	012 331 1615(h)
Newsletter Editor	Pierre Lourens	012 654 6366(h) 072 207 1403
Webmaster	Mauritz Geyser	012 662 0627
Additional Members	Johann Swanepoel	012 667 4870(h) 082 453 0912
	Mike Haslam	012 667 4845 083 675 4984
	Lorna Higgs	012 333 9366(h)
	Wayne Mitchell	012 719 9065(w) 072 465 7739

*Email addresses at [www.pretoria-astronomy.co.za](http://www.pretoria-astronomy.co.za)*